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EXAMINER

ROGERS, DAVID A

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/031,876

Applicant(s)

WIDT ET AL.

Examiner

David A. Rogers

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 4 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 6 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 7 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 01 June 2004 have been fully considered but they are not persuasive.

First Issue: The applicant argues that the previous office action failed to address the raised issue that changing Nothhelfer *et al.* (United States Patent 6,354,142), purportedly by adding an evacuated edge zone, would change the principle of operation of Nothhelfer *et al.*

In response the applicant previous arguments, dated 03 December 2003 and 26 May 2004, were carefully reviewed. In both responses the applicant raised the issue of Nothhelfer *et al.* teaching away from the applicant's claims, and this was properly addressed in the previous office action(s). However, nowhere in the applicant's previous arguments was the issue of principle of operation raised. Therefore, it was not necessary to rebut an issue not raised by the applicant.

Irrespective of the above, this issue has now been raised by the applicant. In rebuttal, the applicant is referred to figures 1 and 2 below. Figure 1 is an excerpt from the second embodiment of Nothhelfer *et al.* In this embodiment two frames and two foils are used as a leak testing apparatus. The only evacuation *for testing* in this embodiment is through a hose connection (reference item 22). Nothhelfer *et al.* does teach that, in their

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second embodiment a region between the foils can be evacuated independently of the main evacuation region for additional sealing purposes.

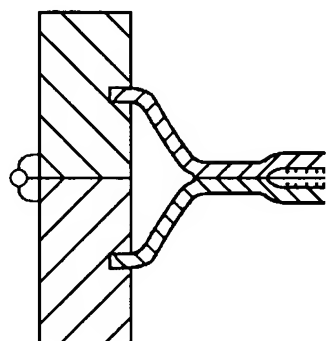


Figure 1

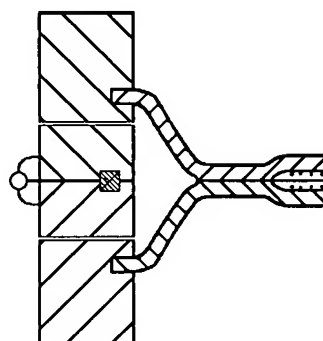


Figure 2

More specifically, Nothhelfer *et al* states:

“For reasons of faster evacuation and/or safety, it may be expedient to provide also in the design example according to drawing FIG. 2, a seal 17 for the frame and means for evacuating the outer edge region, as detailed in connection with drawing FIG. 1.”  
(column 2, lines 60-64)

See figure 2 above for a representation of this disclosed configuration. The outer region as mentioned by Nothhelfer *et al.* is the interior space between the foils where there is no separate layer (reference item 12). Despite the applicant's contention this is not an area that “could be considered an edge zone.” An edge zone, as disclosed and claimed by the applicant, is a space between the frames and not a space between the foils. Anybody reading the applicant's disclosure would not reasonably conclude that the secondary region between the foils of Nothhelfer *et al.* is analogous or anyway similar to an edge zone as disclosed by the applicant.

Furthermore, adding an evacuated edge region to Nothhelfer *et al.* would not change the principle of operation of the embodiment shown in figure 2. An

evacuated edge region would ensure the frame was maintained in a gas-tight, i.e., leak-free, configuration during the leak testing process. The benefit to doing such is clearly taught by Seigeot and/or Varian. See figure 3 below for a representation of this configuration.

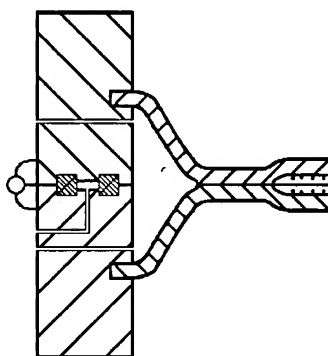


Figure 3

Finally, one could add an evacuated edge region to the first embodiment of Nothhelfer *et al.* (shown below as figure 4) and, for the same reasons noted above, not change its principle of operation. This is because the edge region is a space between the frame and not a space between the foils. See figure 5 below for a representation of this configuration.

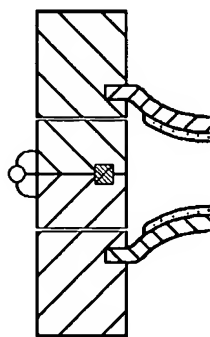


Figure 4

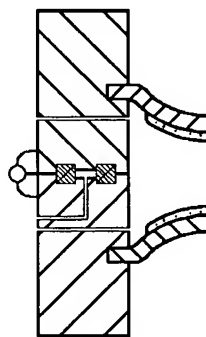


Figure 5

It is requested that, should the applicant desire to continue this argument, evidence beyond mere arguments by the applicant be provided showing how the principle of operation of the second embodiment of Nothhelfer *et al.* would be changed by the addition of an evacuated edge region.

Second Issue: The applicant again argues that, if Nothhelfer *et al.* was modified with the teachings of Seigeot, a test chamber with a bell-shaped cover and a conveyor belt would result and not a foil leak chamber.

This argument again is based on an attempt by the applicant to bodily incorporate the physical structure of Seigeot into the apparatus of Nothhelfer *et al.* As noted previously, and as acknowledged by the applicant, references need not be physically combined in order to show obviousness under 35 U.S.C. 103(a). See MPEP § 2145, section III.

The prior office action relied upon Seigeot to teach that it is known to have a separate, individually evacuated region for maintaining a sealed edge on a leak testing apparatus. What is known from Seigeot is to create a region between two sealing members, and evacuating the region between the seals so as to better hold the chamber together during testing. Seigeot expressly teaches the benefit from this on column 2, lines 5-11:

“In a particular embodiment, said means for guaranteeing the gastightness of said cover comprise two concentric sealing rings, and the system of sealing rings of said backing plate comprises two concentric sealing rings, a second vacuum pump being connected to the space between the sealing rings of said cover and to the space between the sealing rings of said plate.”

In this manner the cover is effectively sealed against the belt conveyor.

This teaching from Seigeot combined with the apparatus of Nothhelfer *et al.* to form a leak testing apparatus would allow the frames of Nothhelfer *et al.* to form a tighter, better seal during testing. Applicant is again directed to Varian where, on page 60, the benefits of an independently-evacuated zone using a double-seal arrangement is also discussed.

Third Issue: The applicant again raises the issue that Nothhelfer *et al.* teaches away from the claimed invention. This issue was properly addressed in the office action mailed 26 February 2004. If the applicant wishes to continue this line of discussion then it requested that the applicant cite column number(s) and line number(s) where it is expressly stated in Nothhelfer *et al.* that having a vacuum sealed region *between the frame members*, i.e., a sealed edge region, is not permitted or allowed, or any other language that would make it apparent to a reasonable person that Nothhelfer *et al.* implies that a vacuum seal *between the frames* is not permitted or allowed.

Fourth Issue: The applicant argues that there is no suggestion in the combination of references to provide a vacuum sufficient to eliminate the need for an outside holding force.

In response to this argument the applicant is requested to point to the column and lines numbers of Nothhelfer *et al.* where it is stated that when a vacuum test is being performed a holding force (presumable applied using the handle) is required.

Furthermore, the presence of a vacuum between the foils, while a test is being performed, will create a delta pressure that will bring the frames of the apparatus of Nothhelfer *et al.* together. For evidence of this see column 3, lines 9-14 where Nothhelfer *et al.* states:

“After having performed an inspection, the test chamber is vented so that the frames 4, 5 are detached from each other and so that the inspected object may be removed.”

Additionally, Seigeot teaches the use of a region formed by two seals, as noted above, for guaranteeing the gastightness of the cover. See also Varian where a leak testing chamber is sealed on its outer edge and held in place using the vacuum seal without the need for an externally applied load.

***Claim Rejections - 35 USC § 112***

2. Claims 8 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant claims a foil leak detection chamber “configured to be hand operated.” Configuring or otherwise adapting a foil leak chamber to be hand operated is not in the specification or claims as originally filed.



***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5, 6, and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,354,142 to Nothhelfer *et al.* in view of "Introduction to Helium Mass Spectrometer Leak Detection" to Varian Associates, Inc. (hereinafter referred to as Varian) and United States Patent 5,373,729t to Seigeot.

Referring to figure 1 above (reproduced from figure 2 of Nothhelfer *et al.* for the convenience of the applicant), Nothhelfer *et al.* teaches an apparatus to test the tightness of a package (reference item 10). The apparatus comprises an upper frame (reference item 4) and a lower frame (reference item 5). Attached to the frames are upper and lower foils (reference items 2 and 3). Coupled to the interior of the two foils is a conduit (reference item 22) attached to a vacuum source. Between the frames is a seal (reference item 17) (see figure 2 above). Nothhelfer *et al.* also expressly teaches:

Seal 17 between the frames 4, 5 is provided for the purpose of sealing off the test chamber to the outside. (column 2, lines 47-49)

and

For reasons of faster evacuation and/or safety, it may be expedient to provide also in the design example according to drawing FIG. 2, a seal 17 for the frame and means for

evacuating the outer edge region, as detailed in connection with drawing FIG. 1.  
(column 2, lines 60-64)

This modification is shown in figure 2 above. Clearly, Nothhelfer *et al.* is concerned with maintaining the seal on the frames to ensure that the integrity of the test is not lost. With regard to claims 8 and 11 Nothhelfer *et al.* teaches a leak testing apparatus with a handle (reference item 6). This handle allows the frames to be hand-operated. Nothhelfer *et al.*, however, does not teach the use of a plurality of seals between the upper and lower frames where the space between the seals is evacuated independently of the space between the foils.

Varian teaches helium leak testing apparatus design. Particularly,  
Varian teaches:

“The effectiveness of helium leak detection is substantially impacted by the...design of the fixturing used to attach the product to the leak detector for testing.” (page 46)

In the section entitled “Fixture Design”, beginning on page 55, Varian also teaches:

#### Vacuum Seals Used in Fixturing

A variety of vacuum seals are used in the design of leak detector fixturing. The characteristics of the more commonly-used vacuum seals are summarized below.

On page 60 Varian shows a helium leak detecting fixture as figure 6-19. Within this fixture are an upper frame and a lower base member forming a test chamber and a test article inside the chamber. Between the upper frame and the base are two O-rings (shown on the right and left sides of the upper member. The region between the O-rings is in fluid communication with a vacuum pump through a bore hole in the base member. The combination of

the two O-rings and their location about the peripheral edge of the upper and lower members defines an edge zone analogous to that of the applicant. Varian teaches that the space between the double O-ring seal is evacuated during the leak testing "for long term sealing integrity under adverse conditions." This vacuum is sufficient to hold the upper member against the lower member without the need for an external holding force.

Seigeot teaches a similar arrangement as that of Varian along with an additional expressed benefit to this arrangement. Seigeot teaches that the leak testing apparatus (reference item 3) comprises a cover (reference item 5) attached to a vacuum pump (reference item 11). The cover further comprises a pair of O-rings (reference items 8 and 9). The space between the O-rings, defining an edge region between the upper and lower members, is evacuated using a second vacuum pump (reference item 18) that operates independently of the first vacuum pump. This second vacuum pump is in direct fluid communication with the region between the seals via a bore hole through the upper cover. Seigeot further states (emphasis added):

"In a particular embodiment, said means for guaranteeing the gastightness of said cover comprise two concentric sealing rings, and the system of sealing rings of said backing plate comprises two concentric sealing rings, a second vacuum pump being connected to the space between the sealing rings of said cover and to the space between the sealing rings of said plate." (column 2, lines 5-11)

In this manner the cover is effectively sealed against the belt conveyor (reference item 1).

In the case of Nothhelfer *et al.*, providing two or more O-rings between the upper and lower frames would have been an obvious modification, as this would provide at least a redundant sealing means in case one of the O-rings was damaged or misaligned. Furthermore, as taught by Seigeot, evacuating a space between the O-rings via bore hole attached to a vacuum pump will guarantee the gastightness of the frames during the testing process thus helping to ensure that the cover is held tight and does not introduce gas into the test chamber, which would also be desirable in the case of Nothhelfer *et al.* That is, any leak from outside the frames of Nothhelfer *et al.*, via the mating surface of the frame members, would be prohibited from reaching the interior space of the foils and thus affecting the test since the region between the seals is in a state of negative pressure due to the vacuum. See figure 3 above for a representation of a testing apparatus of Nothhelfer *et al.* as modified by the teachings of Varian and Seigeot.

Finally, the addition of a separately evacuated edge zone need not be applied to the second embodiment of Nothhelfer *et al.* In fact there is sufficient suggestion and motivation in the teachings of Varian and Seigeot to modify the first embodiment of Nothhelfer *et al.* For the same reasons, this evacuated edge zone would allow any leaks through the frames mating surface to be removed before reaching the testing region between the foils. This would still not change the principle of operation of Nothhelfer *et al.* since only the interior

is used during the *testing* process. The evacuated edge zone helps ensure the integrity of the test by preventing leaks into the test area.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Nothhelfer *et al.* with the teachings of Varian and Seigeot in order to obtain a leak testing apparatus comprising two foils attached to upper and lower frame members where the members seal the interior of the foils by means of two O-rings defining an edge region, and where the space between the O-rings is evacuated.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nothhelfer *et al.* in view of Varian and Seigeot, and further in view of the applicant's admitted prior art.

Nothhelfer *et al.* teaches a foil leak testing apparatus with a hinge. Hinges are known to have springs to provide a biasing force to either help open or close the door upon which they are attached. Furthermore, the applicant admits that springs are commonly used on larger foil test chambers so that the upper frame can be opened automatically during venting. See applicant's disclosure, page 2.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Nothhelfer *et al.* in view of Varian and Seigeot with the teachings of the admitted prior art to provide a spring as biasing means to automatically open the frame during venting.

***Allowable Subject Matter***

6. Claims 3 and 4 are allowed.
7. Claims 7 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Patent 5,182,076 to de Seroux *et al.* provides a vacuum pump (reference item 25) to evacuate a region (reference item 19) between two seals (reference items 13b and 13c) in case there is unintended leakage. de Seroux *et al.* teaches that, even under extreme loads, a single O-ring can leak.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In

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no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Rogers whose telephone number is (703) 305-4451. The examiner can normally be reached on Monday - Friday (0730 - 1600).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
dar

09 February 2005

  
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